Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Wireless Operations in the 3650-3700 MHz Band	)	ET Docket No. 04-151
	)	
Rules for Wireless Broadband Services in the 3650-3700 MHz Band	)	WT Docket No. 05-96
	)	
Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band	)	ET Docket No. 02-380
	)	
Amendment of the Commission's Rules With Regard to the 3650-3700 MHz Government Transfer Band	)	ET Docket No. 98-237

REPLY TO OPPOSITIONS

The Wireless Communications Association International, Inc. ("WCA"), by its attorneys and pursuant to Section 1.429 of the Commission's Rules, hereby submits this reply to oppositions filed in response to petitions seeking reconsideration of the *Report and Order* in the above-captioned proceeding.[1]

I. WIRELESS BROADBAND PROVIDERS CAN SUCCEED ONLY IF THEY CAN OFFER THE QUALITY OF SERVICE THAT NEW APPLICATIONS REQUIRE AND TODAY'S CONSUMERS DEMAND

The record establishes that wireless broadband operators must provide dependable offerings with sufficient Quality of Service ("QoS") to meet the increasing demands of the marketplace. Indeed, wireless Internet service provider ("WISP") RapidDSL & Wireless, Inc. ("RapidDSL") sums up today's market: "consumers desire QoS *as their top priority*."[2] And, QoS is becoming a growing concern as applications like Voice over Internet Protocol ("VoIP")

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[1] *Wireless Operations in the 3650-3700 MHz Band*, Report and Order and Memorandum Opinion and Order, 20 FCC Rcd 6502 (2005) ["*Report and Order*"].

[2] Comments of RapidDSL & Wireless, Inc. in Reply to Petition for Reconsideration, ET Docket No. 04-151, at 3 (filed Aug. 10, 2005) ["RapidDSL Comments"] (emphasis added).

and full motion video streaming have emerged demanding substantial bandwidth and low latency.

At the same time, many WISPs acknowledge the cold reality of trying to offer wireless broadband service using shared-use spectrum in many markets. As LARIAT.NET observes, "Intel et al are correct when they write, 'when WISPs in congested areas attempt to use unlicensed, or nonexclusively licensed, bands – where there can be dozens or even hundreds of simultaneous users – 'tragedy of the commons,' or significant interference, issues tend to emerge often rendering the network virtually useless.'"[3] As a result, WISPs are looking to the 3650-3700 MHz band as an additional opportunity, for example, "to provide much needed Voice over IP technologies that are currently hampered in many areas due to RF congestion in other license exempt bands."[4]

Ultimately, the record establishes fundamental problems inherent in offering a wireless broadband service in any non-exclusive, shared use licensing regime. As RapidDSL explains:

> The problem with fair spectrum sharing protocols, such as contention based, is defining what is truthfully fair? Is it fair to sell 10 mbps service to consumers, and then 1 year later have the capacity drop down to 2 mbps because 5 more providers come to town and deploy? Quality of service is stolen from the users that originally had a better service.[5]

While WCA shares the view that the 3650-3700 MHz band is a promising resource to advance the development of wireless broadband, little will be accomplished if the regulatory regime does not allow providers to offer the level of service new applications require and the public demands.

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[3] Comments of LARIAT.NET, ET Docket No. 04-151, at 2 (filed Aug. 11, 2005).

[4] Comments of PART-15.ORG Responsive to Various Petitions for Reconsideration, ET Docket No. 04-151 *et al*., at 4 (filed Aug. 12, 2005) ["PART-15.ORG Comments"].

[5] RapidDSL Comments at 3.

II. THE CURRENT REGULATORY REGIME DOES NOT PROVIDE THE INTERFERENCE PROTECTION NECESSARY FOR SUFFICIENT QUALITY OF SERVICE, AND THE MODIFIED SHARED-USE SCHEMES PROPOSED IN THE RECORD ARE UNWORKABLE

WCA and others have amply demonstrated that the interference protection components at the heart of the current regulatory regime – the contention-based protocol requirement and the mandatory registration of fixed and base stations – will have the unintended consequence of deterring investment necessary for wireless broadband to thrive in this band. The contention-based rule cannot prevent interference over long distances or solve the "hidden node problem."[6] The registration rule provides no clarity with respect to interference protection rights.

Although several parties favor a non-exclusive licensing approach, there is virtually no support for the regulatory regime adopted in the *Report and Order*.[7] Instead, shared use proponents submit several modified, highly regulatory schemes intended to deliver the interference protection necessary for reliable, high QoS service. While these proposals further underscore that the current rules are far from adequate, they fail to offer workable solutions. WCA addresses the three primary proposals below.

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[6] PART-15.ORG asserts that "WCA has not differentiated … between 'unpredictable delay' in Wi-Fi's 'listen before talk' and the 'unpredictable delay' of other standards based protocols such as 802.16 during its 'timed to talk.'" PART-15.ORG Comments at 11. As WCA illustrated in its petition, at bottom there is no difference – no matter what protocol is used, if there are too many users in a non-exclusive licensing arrangement, service providers cannot offer the QoS that subscribers are demanding. *See* Petition of the Wireless Communications Ass'n Int'l, Inc. for Reconsideration, ET Docket No. 04-151 *et al.*, at 7-9 (filed June 10, 2005) ["WCA Petition for Reconsideration"]. The bottom line is this – contention-based protocols can help reduce interference among users by managing access to the spectrum, but they cannot guarantee that each of an unlimited number of non-exclusive users will experience the speed and latency levels necessary for a successful business.

[7] Cisco Systems, Inc. ("Cisco") appears to be the only party filing significant comments that seems to believe the rules as adopted need no modification. Cisco, for example, states that the contention-based protocol requirement should not be modified (or clarified) "[e]ven if IEEE 802.16™ does not currently meet the requirement" and must undergo revision. Opposition of Cisco to Petitions for Reconsideration, ET Docket No. 04-151 *et al.*, at 11 (filed Aug. 11, 2005) ["Cisco Opposition"]. Cisco further asserts that the interference protection rules are adequate to avoid another tragedy of the commons "if, as Cisco and the Commission expect, the band is used primarily for opportunistic, narrowbeam, backhaul applications." *Id.* at 9. WCA wishes to make clear that, *like the Commission*, it supports flexible use of the band – for both customer service applications *and* backhaul – but the current rules fail to provide sufficient interference protection for either application. For example, investment in and reliance on backhaul links remains a risky proposition in light of the uncertain interference protection rights surrounding the registration rules.

While the Wireless Internet Service Providers Association ("WISPA") asserts that the contention-based rule "creates an environment that's as good as having a licensed band," it nonetheless advances a laundry list of additional requirements to address the current rules' "uncertainty."[8] First among them is a proposal to allocate time frames among licensees by breaking a second "into an equal number of segments" and requiring systems "to negotiate with all others in the area for an equal number of time slots in a given channel."[9] WISPA then seeks to impose efficiency rules and usage limits – for example, prohibiting any single system from "us[ing] more than 25% of the spectrum" or, for point-to-point systems, 33% of the spectrum.[10]

As an initial matter, the proposal would require that all systems deploy technologies using a protocol to synchronize operations – a process that would either take years in various international standards-making bodies or require a single technology for the band (and could deter equipment makers from developing products acceptable for the US market).[11] Even if modified somehow to deal with the realities of implementation, the proposal would be no solution as there will come a point at which so many users are attempting to access the spectrum that the gap between a given user's allocated time frames becomes too great to support applications that require low latency, such as VoIP. Further, WISPA does not address questions whether there would be a one-time opportunity for prospective operators to negotiate access or whether and how new entrants could gain access to time slots assigned to existing non-exclusive providers.

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[8] *See* Comments of WISPA in Reply to Petition for Reconsideration in regarding 3650Mhz, ET Docket No. 04-151, at 1 (filed Aug. 3, 2005) ["WISPA Reply"]; *see also* Consolidated Opposition of Wireless Communications Ass'n Int'l, Inc and Comments to Petitions for Reconsideration, ET Docket No. 04-151 *et al*., at 4 n.9 (filed Aug. 11, 2005) ["WCA Opposition"] (summarizing the eight new licensing and interference protection requirements WISPA urges the Commission to adopt).

[9] WISPA Reply at 1.

[10] *Id.* at 2.

[11] WCA does not believe that WISPA favors a single technology in the band.

XO Communications, Inc. ("XO") and other parties such as the American Petroleum Institute ("API") and the Enterprise Wireless Alliance ("EWA") favor a different licensing scheme that provides for non-exclusive, site-based licensing and relies heavily on frequency coordination for interference protection. XO, which views this band primarily as "last mile wireless broadband spectrum,"[12] observes that coordination takes place under Parts 90 and 101 of the Commission's Rules and references the 70, 80, 90 GHz proceeding as a non-exclusive licensing regime with fixed station registration. XO proposes "Part 90 style coordination" among system operators and, like API, seeks "first in time" interference protection.

The Commission has recognized that a site-by-site approach, coupled with coordination, can be an appropriate approach where the spectrum is used for private, internal purposes because "when spectrum is used for private internal services, it is not necessary to develop geographic area licensing to ensure that service is widely available to the general public."[13] In contrast, the Commission comes to a different conclusion where spectrum will be used for wide-area services, finding that geographic licensing "poses significant advantages over site-based licensing because of the greater operational flexibility it gives licensees and the greater ease of administration for consumers, licensees, and regulators."[14] Indeed, the distinction in treatment between site-based and wide-area services is reflected in Parts 90 and 101, where services such as LMDS and auctioned 220 MHz and 800 MHz licensees are granted on an exclusive-use, wide-area basis and

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[12] Opposition of XO Communications, Inc. to Petitions for Reconsideration, ET Docket No. 04-151 *et al*., at ii, 4 (filed Aug. 11, 2005) ["XO Opposition"].

[13] *Multiple Address Systems*, Report and Order, 15 FCC Rcd 11956, 11973 (2000).

[14] *Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands*, Notice of Proposed Rulemaking and Memorandum Opinion and Order, 18 FCC Rcd 6722, 6749 (2003), *see also Amendment of Parts 2, 15, and 97 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications*, Second Report and Order, 12 FCC Rcd 10571, 10599 (1997) ("[l]icensing on the basis of geographic service areas facilitates operation of a broad range of new services and promotes their introduction in the most rapid and efficient manner.").

licensees have no obligation to prior coordinate facilities with each other. The 70, 80, 90 GHz proceeding, moreover, proves the exception to the rule. Therein, the Commission observed, "geographic area licensing is not appropriate in these bands, where scope and ubiquity of geographic coverage is not expected to be an important feature of either carrier or private entity operations and where the use of spectrum by one entity in a geographic area very rarely precludes the re-use of that spectrum by another entity due to the highly directional point-to-point 'pencil-beam' transmissions."[15] This is not the case here.

Finally, AirStream Data LLC ("AirStream") offers a third licensing approach that would set a deadline to apply for non-exclusive licensing on a market-by-market basis, eliminate the contention-based protocol rule, and require licensees to negotiate a "nationwide agreement" on "the methodology to prevent the licensees from causing interference to each other" (while allowing some interference matters to be resolved on a market-by-market basis).[16]

At its core, the AirStream proposal imposes a radical approach to spectrum management: collect all parties interested in becoming a service provider, stick them in a room, and ask them to develop interference protection rules. On its face, this process would be unwieldy and no doubt lengthy. More fundamentally, the proposal would have the Commission in effect abdicate its role as the nation's spectrum manager and there would be no guarantee that the end result would serve the public interest. While WCA does not advocate "command and control" regulation, the Commission must establish the "rules of the road" in spectrum management.

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[15] *Allocations and Service Rules for the 71-76 GHz, 81-86 GH, and 92-95 GHz Bands*, Report and Order, 18 FCC Rcd 23318, 23337-38 (2003).

[16] Comments of AirStream Data LLC, ET Docket No. 04-151 *et al*., at 5-6 (filed Aug. 11, 2005).

III. WCA PROPOSES A NEW, PRIMARILY EXCLUSIVE USE LICENSING REGIME THAT OFFERS SUFFICIENT INTERFERENCE PROTECTION AND ENSURES THAT RURAL WISPS AND OTHERS HAVE ACCESS TO SPECTRUM

Many proponents of non-exclusive licensing do not appear to oppose exclusive-use licensing *per se*, but rather fear that in an auction context, WISPs would be "economically foreclosed from participation."[17] The fundamental issue, WCA believes, is ensuring a reasonable opportunity to access exclusive-use spectrum. As PART-15.ORG states, "WISP operators are open to alternative (licensed) solutions that would not present a cost prohibitive environment for this band to the small to medium entrepreneurs."[18]

WCA proposes the following revised licensing scheme that promotes service reliability and QoS, while ensuring that small and medium-sized WISPs have ample opportunity to gain access to the spectrum in an environment that is not "cost prohibitive":

- The Commission should create two 25 MHz blocks licensed on an MSA/RSA basis[19];
- Both of the 25 MHz blocks in MSAs would be licensed by auction for exclusive use;
- One of the RSA blocks would be licensed by auction for exclusive use and the other RSA block would be made available under the *Report and Order's* non-exclusive licensing regime (subject to the revisions suggested by WCA); and
- The Commission's designated entity ("DE") bidding credit rules would apply, and package bidding would be prohibited.

This licensing plan recognizes the realities involved in the provision of wireless broadband *and* ensures that smaller entities have opportunities to access the spectrum. First, the

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[17] LARIAT.NET Comments at 1; *see also* PART.15-ORG Comments at 7.

[18] PART.15-ORG Comments at 8.

[19] RapidDSL opposes licensing two 25 MHz blocks largely because "WISPs need the ability to move around channels to steer around interference." RapidDSL Comments at 1. Under WCA's proposal, however, the auction winners would hold exclusive-use licenses, thereby reducing the need to gain maximum bandwidth "to steer around interference." Further, WCA's support for a 25 MHz spectrum block licensed on a non-exclusive basis is limited to RSAs, and RapidDSL acknowledges, "[t]he truth is, in a rural area, there are fewer subscribers, and therefore less bandwidth and channels needed to serve them, and fewer providers with the need to share the spectrum." *Id*. at 2. In addition, WCA observes that no vendors expressed concern that a 25 MHz assignment would be too limiting.

plan provides exclusive-use licensing in urban markets – the only way to ensure sufficient interference protection in more congested markets. At the same time, providers in more rural areas can choose whether QoS or simple access to spectrum is their highest priority.[20] And, as the Commission reaffirmed earlier this month, spectrum licensed on the basis of the 734 RSAs and MSAs "will foster service to rural areas and tribal lands and thereby bring the benefits of advanced services to these areas."[21] The Commission stated further, "RSAs and MSAs allow entities to mix and match rural and urban areas according to their business plans and . . . by being smaller, these types of geographic service areas provide entry opportunities for smaller carriers, new entrants, and rural telephone companies."[22]

To further encourage the participation of small and medium entrepreneurs in both MSA and RSA market auctions, WCA supports DE bidding credit rules, which have had a dramatic effect in ensuring that smaller entities can acquire spectrum at auction. Again, the Commission just recently found, "in examining all auctions of non-broadcast licenses where no spectrum was set aside for designated entities, we have determined that designated entities won approximately 53 percent of all of the licenses won in these auctions."[23] Finally, WCA supports the proposal by TDS Telecommunications Corp. to conduct the auction without combinatorial or package bidding to address "the so-called 'threshold problem' – making it difficult for them to compete against large companies and potentially undoing the benefits of smaller license sizes."[24]

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[20] *See* Comments of TDS Telecommunications Corp., ET Docket No. 04-151 *et al*., at 6-7 (filed Aug. 11, 2005) ("[t]he Commission should not limit exclusive licensing of the 3650 MHz band to urban markets. . . . Rural and suburban populations deserve the same, interference-free broadband access enjoyed by their urban counterparts.") ["TDS Comments"]; *see also* WCA Petition for Reconsideration at 12.

[21] *Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands*, WT Docket No. 02-353, Order on Reconsideration, FCC 05-149, at ¶ 14 (rel. Aug. 15, 2005).

[22] *Id.*

[23] *Id*. at ¶ 30.

[24] TDS Comments at 7 n.8.

This licensing plan provides a roadmap to spur investment and rapid deployment.[25] It relies primarily on exclusive-use licensing, ensuring that small and medium entrepreneurs can secure spectrum at reasonable costs while also allowing more interference-tolerant providers access to shared use spectrum in rural areas.

IV. THE 150 KM FSS EXCLUSION ZONE MUST BE MODIFIED BUT THE PROPOSALS TO PROVIDE FURTHER PROTECTION TO C BAND SATELLITES ARE UNFOUNDED

As WCA noted previously, while grandfathered Fixed Satellite Service ("FSS") earth stations in the 3650-3700 MHz band warrant interference protection, the *Report and Order's* negotiated entry policy creates onerous transaction costs and impose unnecessary burdens on fixed station ("FS") operators. Several parties including Sprint Corporation, an FSS earth station operator, join WCA in calling for adoption of Part 101 coordination procedures for new FS operators.[26]

The Satellite Industry Association ("SIA") misconstrues WCA's position, opposing Part 101 coordination with new operators in the band because "[e]ven though base station transmitters would be registered and fixed," such base stations transmit and receive from mobile units.[27] WCA, however, called for Part 101 coordination involving *FS* operators, *i.e.* fixed point-to-point providers such as backhaul providers. Here, the issue truly is coordination among two fixed operator licensees, the FS station and the FSS earth station, and there is no reason to depart from the Part 101 coordination process, which has a proven track record of providing effective

[25] To the extent any concerns exist regarding deployment, WCA supports reasonable performance requirements. *See* WCA Petition for Reconsideration at 16-19. Further, the Commission has previously stated, "'[w]hen the license is purchased by auction, the out-of-pocket expenditure by the licensee makes the cost of not exploiting the license more obvious and explicit, which may be particularly effective in deterring warehousing." *Implementation of Section 309(j) of the Communications Act*, Notice of Proposed Rulemaking, 8 FCC Rcd 7635, 7650 (1993); *see also Amendment of Part 90 of the Commission's Rules*, Second Report and Order, 12 FCC Rcd 19079, 19094 (1997) ("by participating in the auction, licensees will have shown that they are genuinely interested in acquiring spectrum to utilize and not warehouse.").

[26] Comments of Sprint Corporation, ET Docket No. 04-151 *et al*., at 2 (filed Aug. 11, 2005).

[27] Opposition of Satellite Industry Ass'n to Petitions for Reconsideration and Comments, ET Docket No. 04-151 *et al*., at 13 (filed Aug. 11, 2005).

coordination for thousands of fixed microwave paths and earth stations to share the 3.7-4.2 GHz and 10.7-11.7 GHz downlink bands where an FS transmitter could potentially cause interference.

For similar reasons, moreover, this coordination requirement between two fixed operators is far different from the calls identified above to adopt coordination requirements among non-exclusive licensees seeking to provide last mile broadband access. As previously noted, in that scenario coordination simply will not work.

Finally, Motorola, Inc. ("Motorola") joins WCA in urging the Commission to reject SIA's request for the Commission to adopt unnecessarily stringent out-of-band emission limits to benefit adjacent C Band FSS earth station receivers, noting that SIA requests levels almost 30 dB more stringent that the level set forth in the new rules.[28] Motorola agrees with the Commission's recognition that the protection criterion proposed by SIA is overly conservative and unsupported by either measurement or operational experience.

V. CONCLUSION

For the reasons discussed above, WCA urges the Commission to reconsider the 3650-3700 MHz regulatory regime and adopt its proposals to modify the rules.

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[28] Opposition of Motorola, Inc. ET Docket No. 04-151 *et al*., at 3 (filed Aug. 11, 2005).

CERTIFICATE OF SERVICE

I, Michelle A. Bynum, hereby certify that on this 24th day of August, 2005 I served the foregoing "Reply to Oppositions" by depositing true copies thereof with the United States Postal Service, first class postage pre-paid and addressed to the following:

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